

JESRAY

2.4GHz WIRELESS CAMERA SYSTEM



FCC

FCC ID: NOQJM2073

Please consult the back cover of this book for model and function

OPERATING INSTRUCTIONS

- Before operating the unit, please read this manual thoroughly

SAFETY INSTRUCTIONS

Important – Safety Precautions

1. To prevent fire or shock hazard, do not expose this device to rain or moisture.
2. Do not use this video device near water. For example, a bathtub, watch bowl, kitchen sink, laundry tub or swimming pool, or in a wet basement.
3. No naked flame sources, such as lighted candles, should be placed on this device.
4. To avoid electrical shock, do not open this device, and do not insert any metallic object through the ventilation grills.
5. There is 10cm minimum distance around this device for sufficient ventilation.
6. The ventilation should not be impeded by covering the ventilation openings with items, such as newspapers, table cloths, curtains, etc.
7. This device should be operated to use only the power supply included with it or provided as an accessory.
8. Do not overload wall outlets and extension cords as this can result in the risk of fire or electrical shock.
9. Do not place this device on an unstable cart, stand, or table. The device may fall, causing spurious injury to a child or adult, and serious damage to the device. Wall or shelf mounting should follow the manufacturer's instructions and should be done with a mounting kit approved by the manufacture.

Caution 1:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Caution 2: AC/DC adaptor

Handle the AC adaptor carefully; improper handling is dangerous.

- Do not touch it with wet hands.
- Do not place heavy objects on top of it.
- Do not forcibly bend it.
- Be sure to connect only the AC/DC adaptor provided with the device.
- Disconnect the AC/DC adaptor from the power outlet if the device is not going to be used for a long time.

SAFETY INSTRUCTIONS

Caution 3: Dry cell batteries for Remote Control

To prevent damage to the batteries and electrolyte leakage, heed the following points:

- Align the “+” and “-” polarities properly when inserting the batteries.
- Do not mix different types or makes of batteries or old and new batteries.
- Remove the batteries if you do not plan to use the device for a long period of time.
- Do not throw batteries into a fire, and do not short circuit, disassemble or subject them to excessive heat.

Note:

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, (which can be determined by turning the equipment off and on), the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

CONTENTS

CHAPTER TABLE OF CONTENTS PAGE

1. CHECKING CONTENTS OF BOX	4
2. CONTROLS AND FUNCTIONS	
2-1 2.4GHz WIRELESS CAMERA.....	5
2-2 2.4GHz WIRELESS RECEIVER.....	6
2-3 REMOTE CONTROLLER.....	7
3. INSTALLATION	
3-1 BATTERIES.....	8
3-2 2.4GHz WIRELESS CAMERA.....	9
3-3 2.4GHz WIRELESS RECEIVER.....	10
3-4 ADJUSTING THE ANTENNA.....	11
4. SYSTEM OPERATION	
4-1 OPERATION WITH TV	12
4-2 OPERATION WITH TV & VCR.....	13
4-3 OPERATION WITH MONITOR	14
4-4 OPERATION WITH MONITOR & VCR.....	15
5. MULTIPLE CHANNEL OPERATION	
5-1 ONE RECEIVER BY MULTIPLE CAMERA OPERATION	16
5-2 ONE CAMERA BY MULTIPLE RECEIVER OPERATION.....	18
6. TROUBLE SHOOTING.....	20
7. SPECIFICATIONS.....	21

BOX CONTENTS

CHECKING CONTENTS OF BOX

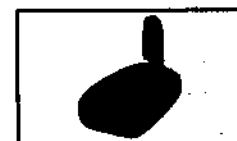
Check to make sure that all of the items shown as below are included with your 2.4GHz Wireless Camera System (indoor only). If something is missing, please contact your dealer as soon as possible.



2.4GHz Wireless Camera

*Please consult the back cover of this book for model and function

×1



2.4GHz Wireless Receiver

*Please consult the back cover of this book for model and function

×1



☐ Remote controller (optional)

×1



Power adapter

- ☐ (230VAC to 12VDC) or
☐ (120VAC to 12VDC)

DC in Jack (⊖ ⊕) 12V 500mA



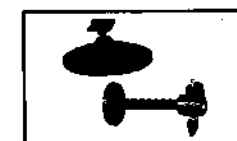
×2



Audio/Video cable

- ☐ RCA to scart connector
☐ RCA to RCA connector

×1



Camera mounting bracket (optional)

- ☐ Plastic Base
☐ Steel Base

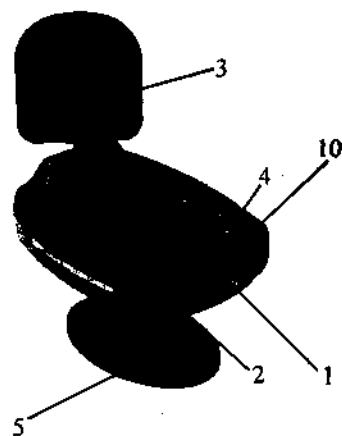
×1

User's manual

×1

2.4GHz WIRELESS CAMERA

FRONT VIEW

**1. LENS**

1/4" B/W or color Image sensor with built-in 64° fixed wide-angle lens.

2. MICROPHONE

Built-in condenser microphone.

3. 2.4GHz ANTENNA

High gain directional patch antenna sends A/V signal to the receiver.

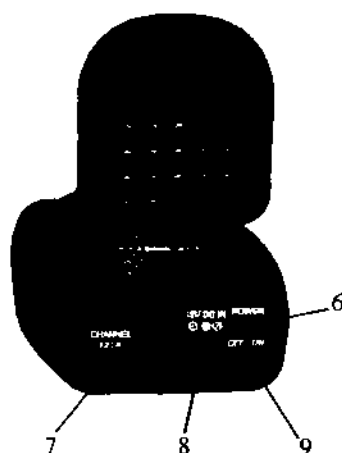
4. INFRARED ILLUMINATORS

Built-in Infrared LEDs illuminate the image to let you see it clearly even when an object is in 0.5 lux darkened area.(B/W Camera only)

5. STAND MOUNTING BASE

Reinforcement lock for camera stand.

REAR VIEW

**6. LED-POWER INDICATOR**

Indicates that the camera is turned on.

7. CHANNEL SELECTOR SWITCH

Switch for the channel 1-4 selection.

8. DC INPUT JACK

Plug the DC12V 500mA AC adaptor in here.

9. POWER SWITCH

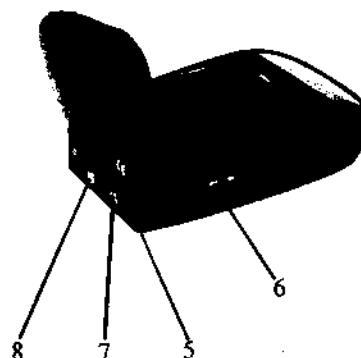
Controls power ON/OFF. Be sure to set the switch to OFF position before plugging the AC adaptor into the unit and AC outlet.

10. FOCUS KNOB

Adjust focus for optimum reception.

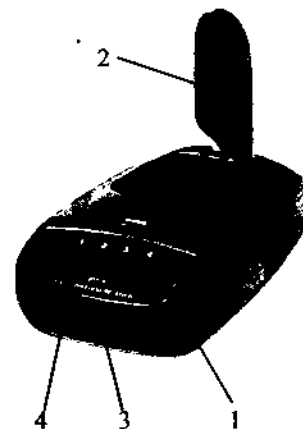
2.4GHz WIRELESS RECEIVER

REAR VIEW

**1. CHANNEL SELECTOR BUTTON**

- 1a. Select Auto or Manual channel switching mode by pressing no release this button over 3 second.
- 1b. CH1 or CH2 or CH3 or CH4 will be selected by pressing this button under Manual mode within 3 second.
- 1c. Under Auto scan mode within 3 second, CH1, CH2 will be selected by pressing this button one time, CH3, CH4 will be selected by pressing this button two times, CH1, CH2, CH3 will be selected by pressing this button three times, CH1, CH2, CH3, CH4 will be selected by pressing this button four times.
- 1d. If there is no input within 3 second Auto scan sequence mode will be started automatically.
- 1e. At that time each selected channel LED should be on.

FRONT VIEW

**2. 2.4GHz ANTENNA**

High gain directional patch antenna receives A/V signal from the camera.

3. REMOTE CONTROL WINDOW

Infrared passes through this to remotely control the receiver.

4. LED CHANNEL INDICATORS

Indicate selected channel.

5. DC INPUT JACK

Connect the supplied DC12V 500mA AC adaptor.

6. POWER SWITCH

Controls power ON/OFF. Be sure to set the switch to OFF position before plugging the AC adaptor into the unit and AC outlet.

7. VIDEO OUTPUT JACK (yellow)

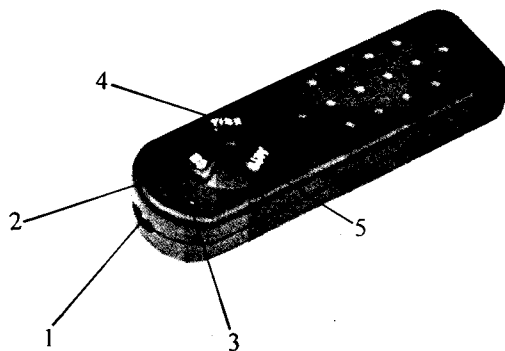
RCA jack for Video output connection.

8. AUDIO OUTPUT JACK (White)

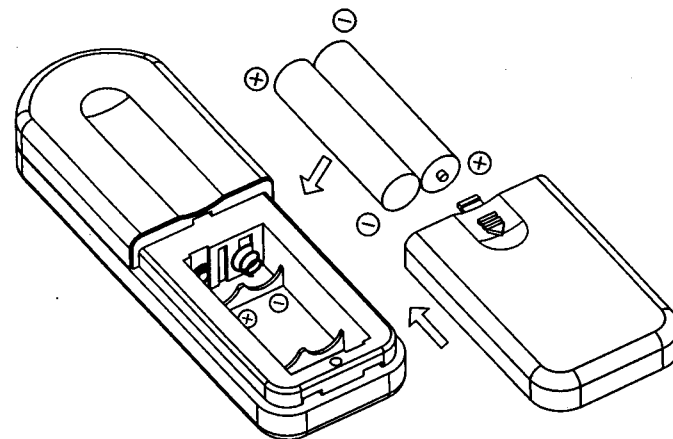
RCA jack for Audio output connection.

REMOTE CONTROLLER

BATTERIES



Installing Batteries



1. INFRARED LED

To send the infrared control information.

2. CHANNEL SELECTOR BUTTON

2a. MANUAL MODE

CH1 or CH2 or CH3 or CH4 will be selected by pressing this button.

2b. AUTO SCAN MODE

CH1, CH2 will be selected by pressing this button one time, CH3, CH4 will be selected by pressing this button two times, CH1, CH2, CH3 will be selected by pressing this button three times, CH1, CH2, CH3, CH4 will be selected by pressing this button four times.

2c. At that time each selected channel LED should be on.

3. PUSH BUTTON INDICATOR'S LED

Indicate completed push button.

4. DWELL TIME BUTTON (1-9 sec)

The automatic switching time in multiple channel operation on auto scan mode by pressing this button. At that time the LED is twinkled as much as time. For instance time setted 5 second then LED is twinkled 5 times. (The detail see page 17)

5. AUTO/MANUAL MODE BUTTON

Select Auto or Manual channel switching mode by pressing this Button. (The detail see page 17)

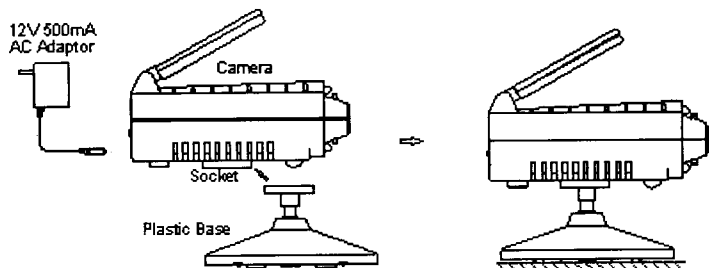
1. Open the battery compartment cover.

2. Insert 2 "LR03"-size batteries (provided) in the correct directions.

3. Replace the cover.

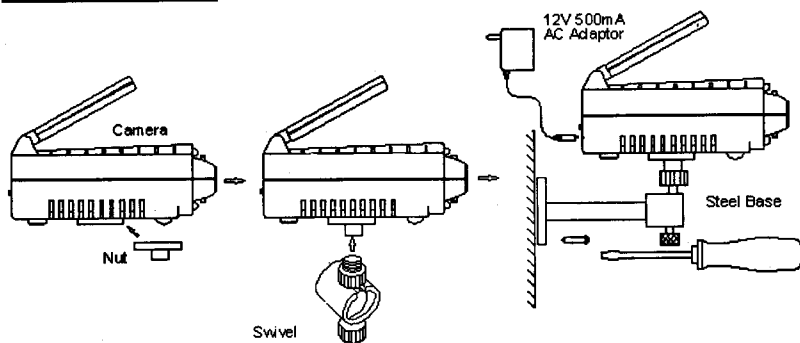
2.4GHz WIRELESS CAMERA

PLASTIC BASE



1. Attach the plastic base to stand mounting socket of the Camera bottom.
2. Take the plastic base from stand mounting socket as necessary.
3. Connect the supplied 12V 500mA AC adaptor to the DC IN jack at the rear of the Camera and plug it into 230V (or 120V) AC outlet.

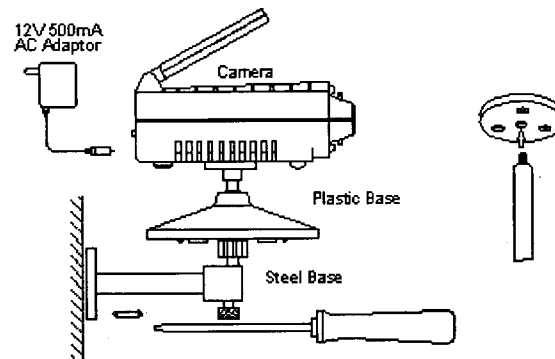
STEEL BASE



1. Attach the steel base to the wall or ceiling where you want to install the Camera. Locate a wall stud or ceiling joist and secure bracket using the three supplied screws.
2. Attach the Camera to the stand and firmly tighten the swivel.
3. Attach the Camera with the stand to the steel base and firmly tighten the joint knob on the steel mounting bracket.
4. Connect the supplied 12V 500mA AC adaptor to the DC IN jack at the rear of the Camera and plug it into 230V (or 120V) AC outlet.

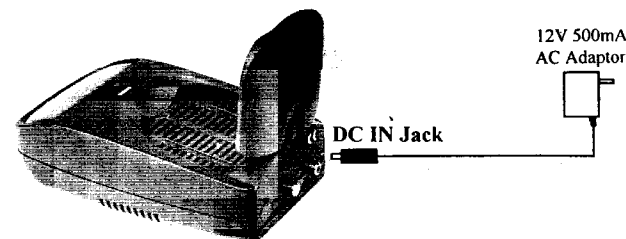
2.4GHz WIRELESS CAMERA

PLASTIC BASE & STEEL BASE



1. Attach the steel base to wall or ceiling where you want to install the Camera. Locate a wall stud or ceiling joist and secure bracket using the three supplied screws.
2. Attach the Camera with the plastic base to the steel base and firmly tighten the joint knob on the steel mounting bracket.
3. Connect the supplied 12V 500mA AC adaptor to the DC IN jack at the rear of the Camera and plug it into 230V (or 120V) AC outlet.

2.4GHz WIRELESS RECEIVER



1. Place the Wireless Receiver on or near the TV or Monitor.
2. Connect the supplied 12V 500mA AC adaptor to the DC IN jack at the rear of the Receiver and plug it into 230V (or 120V) AC outlet.

INSTALLATION

SYSTEM OPERATION

ADJUSTING THE ANTENNA

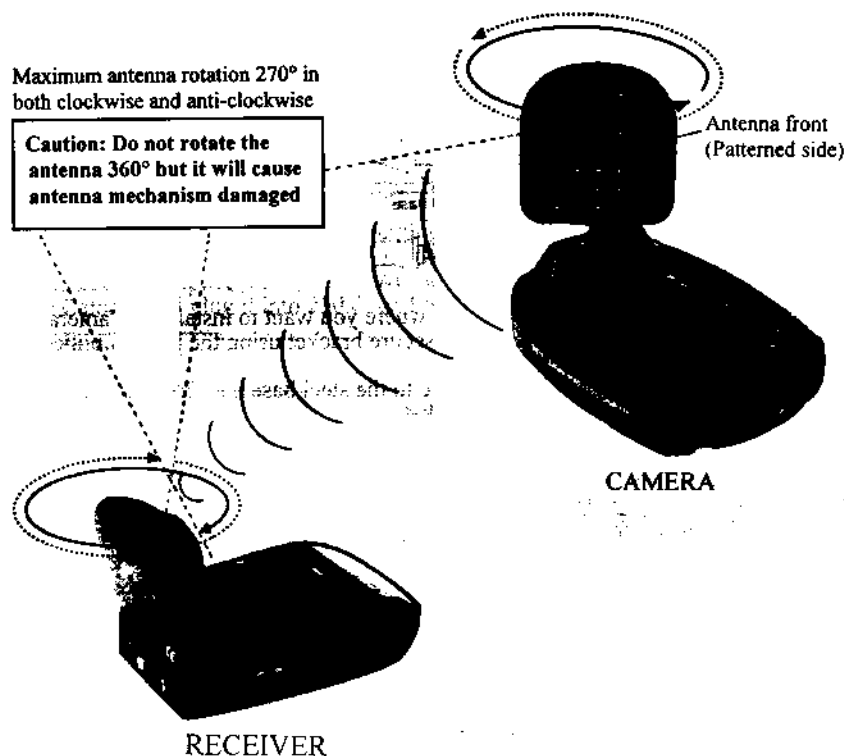
OPERATION WITH TV

NOTE: The front (patterned side) of the antennas on both Camera and Receiver unit must face each other for optimum performance, as both are directional high gain antennas.

You can connect both units with RCA to scart cable.

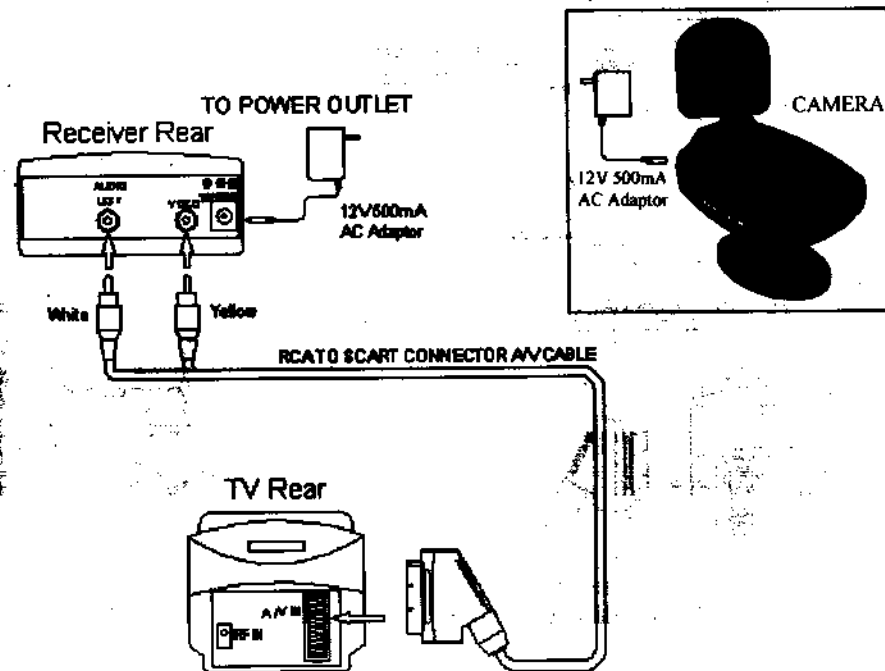
Maximum antenna rotation 270° in both clockwise and anti-clockwise

Caution: Do not rotate the antenna 360° but it will cause antenna mechanism damaged



IMPORTANT NOTE FOR CHANNEL SELECTION

Search the channel 1-4 and select best one for optimum reception in your area. Both Camera and Receiver must be set at same channel.

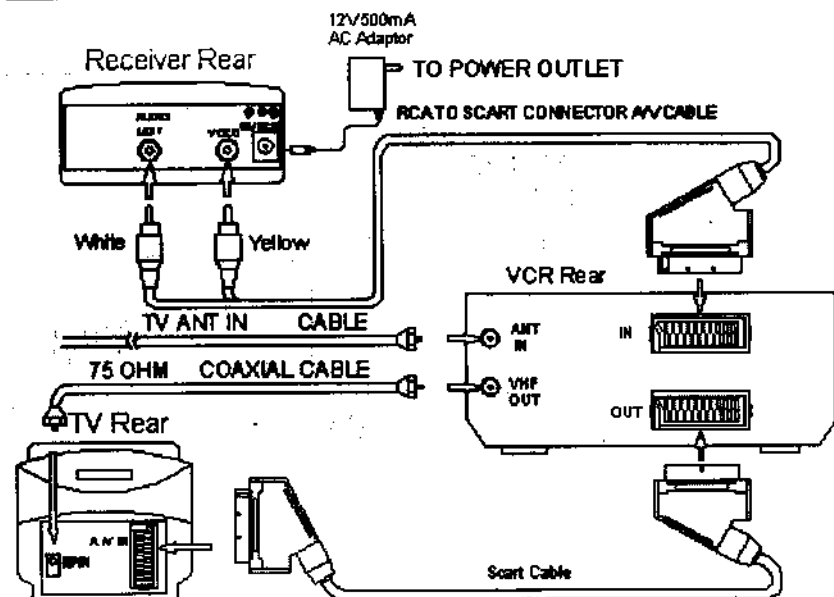


NOTE

Be sure to set the Power Switch on the Receiver and Camera to the OFF position before proceeding with the following steps.

1. Connect one end of the RCA cable to the Audio (L)/Video jacks at the rear of the Receiver. Plug the other end of RCA cable (or scart cable labeled "Receiver") into the Audio (L)/Video in jacks on your TV. *Be sure to match the plug color on the cable in both connections.*
2. Turn on the Camera and Receiver. Set your TV to Video mode to view the receiving signal from the Camera.
3. Adjust the antenna direction as necessary.

OPERATION WITH TV & VCR



NOTE

Be sure to set the Power Switch on the Receiver and Camera to the OFF position before proceeding with the following steps.

1. Connect one end of the RCA cable to the Audio (L)/Video jacks at the rear of the Receiver. Plug the other end of RCA cable (or scart cable labeled "Receiver") into the Audio (L)/Video in jacks on your VCR. *Be sure to match the plug color on the cable in both connections.*
2. Connect one end of another scart cable to the Audio/Video jacks on your TV. Plug the other end of Scart cable into the Audio/Video Out jacks on your VCR.
3. Turn on the Camera and Receiver. Set your TV to Video mode to view the receiving signal from the Camera.
4. Search the channel 1-4 by using Channel Selector Switch on the Receiver and Camera. Select best one for optimum reception in your area.

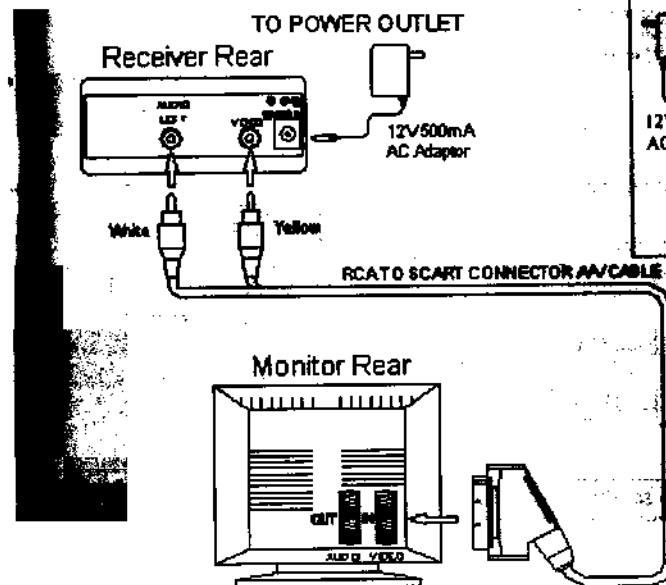
NOTE

Both Camera and Receiver units must be set at same channel.

5. Adjust the antenna direction as necessary.

OPERATION WITH MONITOR

You can connect both units with RCA to scart cable.



NOTE

Be sure to set the Power Switch on both Receiver and Camera to the OFF position before proceeding with the following steps.

1. Connect one end of the RCA cable to the Audio (L)/Video jacks at rear of the Receiver. Plug the other end of RCA cable (or scart cable labeled "Receiver") into the Audio (L)/Video in jacks on your Monitor. *Be sure to match the plug color on the cable in both connections.*
2. Turn on the Camera and Receiver.
3. Turn on your Monitor.
4. Search the channel 1-4 by using Channel Selector Switch on the Receiver and Camera and select best one for optimum reception in your area.

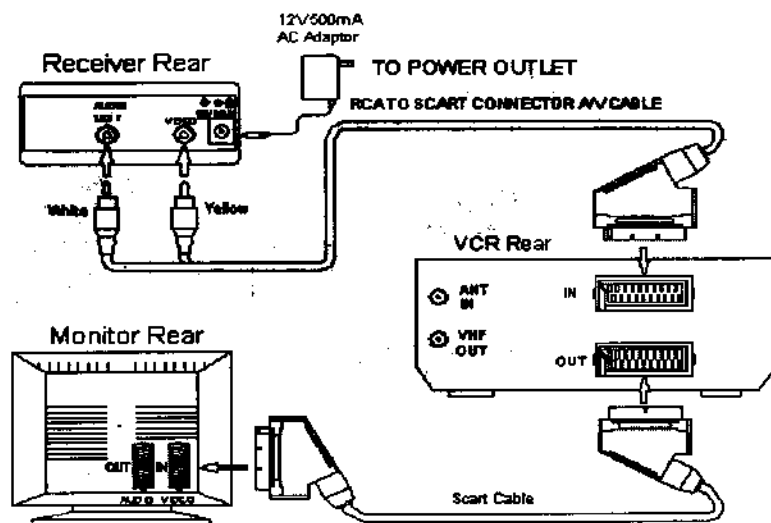
NOTE

Both Camera and Receiver units must be set at same channel.

5. Adjust the antenna direction as necessary.

SYSTEM OPERATION

OPERATION WITH MONITOR & VCR



NOTE

Be sure to set the Power Switches on both the Receiver and Camera to the OFF position before proceeding with the following steps.

1. Connect one end of the RCA cable to the Audio (L)/Video jacks at the rear of the Receiver. Plug the other end of RCA cable (or scart cable labeled "Receiver") into the Audio/Video in jacks on your VCR. *Be sure to match the plug color on the cable for both connections.*
2. Connect one end of another scart cable to the Audio (L)/Video in jacks on your Monitor. Plug the other end of scart cable into the Audio (L)/Video Out jacks on your VCR.
3. Turn on the Camera and Receiver.
4. Turn on your Monitor and VCR.
5. Search the channel 1-4 by using Channel Selector Switch on the Receiver and Camera and select best one for optimum reception in your area.

NOTE

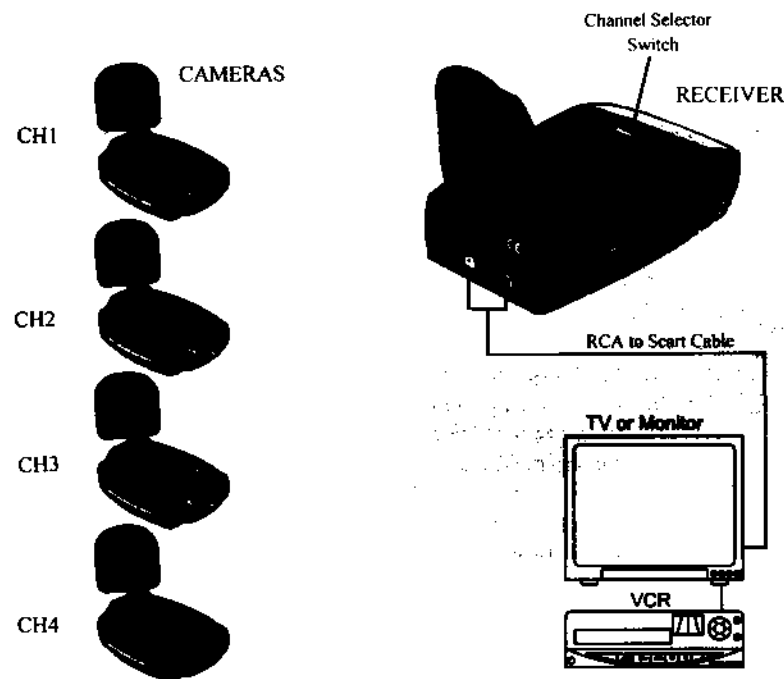
Both Camera and Receiver units must be set at same channel.

6. Adjust the antenna direction as necessary.

MULTIPLE CHANNEL OPERATION

ONE RECEIVER BY MULTIPLE CAMERA OPERATION

You can receive A/V signals from several Wireless Cameras on your TV or Monitor in remote location using multiple Wireless Cameras with one Wireless Receiver as this system is four wireless channel capabilities and has built-in auto/manual channel switcher.



NOTE

Be sure to set the Power Switches on the Cameras and the Receiver to the OFF position before proceeding with the following steps.

1. Place all cameras at your desired location. *(Please keep all cameras at a distance for least interference)*

NOTE

System includes only one Sending and one Receiving unit. Additional units are optional.

ONE RECEIVER BY MULTIPLE CAMERA OPERATION (Cont'd)

2. Connect the Receiver unit to your TV with or without VCR using RCA cable. (or scart cable labeled "Receiver") (see instructions on page 12-15)
3. Turn on all Cameras. **The Cameras must use different channel.** Select the channel 1-4 by using Channel Selector Switch on each Camera unit.
4. Turn on your remote TV or Monitor that is connected to the Receiver. (If you are using TV, Set your TV to Video mode.)
5. Turn on Receiver and select auto or manual channel switching mode using AUTO/Manual Selector button on the Remote Controller. On auto scan mode, channel 1-4 will be switched sequentially and you will receive the signals from multiple Cameras on your TV or Monitor screen one and another automatically. Adjust the Dwell Time (1-9sec.) as you desired, by "TIME" button on the Remote Controller.

5a. AUTO MODE

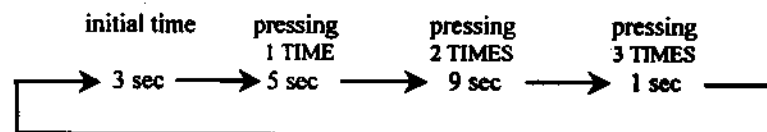
Select auto mode by pressing "AUTO" button under Manual mode on the Remote Controller or by pressing no release channel selected button on Receiver over 3 second.

5b. Returning the Manual mode from Auto mode

Return the last selected Channel state at previous Manual mode, by pressing "AUTO" button again on Remote Controller or by pressing no release channel selected button again on Receiver over 3 second.

5c. TIME setting (under auto mode)

Display time of channels will be delayed one second up to nine second by pressing time of "TIME" button on Remote Controller.

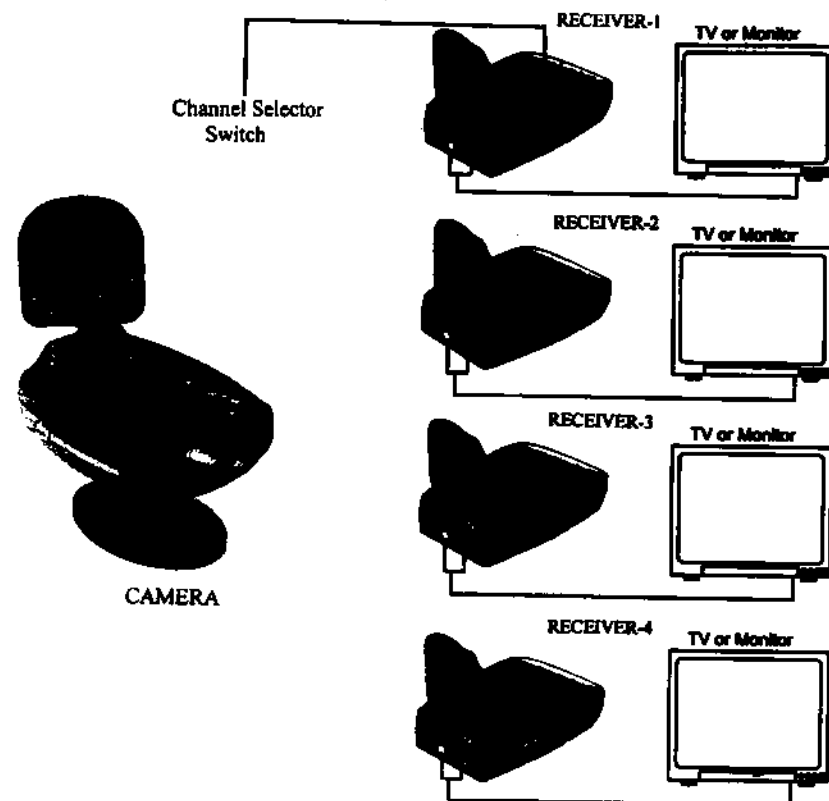


At that time the LED is twinkled as much as time. For instance time setted 5 second then LED is twinkled 5 times.

6. Also you can select the channel 1-4 one by pressing channel selector switch on the Receiver. Your TV or Monitor will display the signal from an A/V source as selected.
7. Adjust the antenna direction as necessary.

ONE CAMERA BY MULTIPLE RECEIVER OPERATION

You can receive A/V signal from the Wireless Camera on several TVs or Monitors in remote location at the same time using one Wireless Camera with multiple Wireless Receiver as many as you want.



Be sure to set the Power Switches on the Camera and Receivers to the OFF position before proceeding with the following steps.

1. Connect all Receiver units to your TV or Monitor with or without VCR using RCA cables.(or scart cables labeled "Receiver")(see instructions on page 12-15)

ONE CAMERA BY MULTIPLE RECEIVER OPERATION (Cont'd)

NOTE

System includes only one Receiving and one Sending unit
Additional units are optional.

2. Turn on all TVs or Monitors, which are connected to the Receiver units. (If you are using TV, Set all TVs to Video mode.)
3. Turn on the Camera and all Receiver units. Search the channel 1-4 by using Channel Selector Switch on the Camera and Receivers and select the best one for optimum reception in your area.

NOTE

All Receiver and Camera units must be set at same channel.

4. Adjust the antenna direction as necessary.

If the system does not function properly, check the following points before contact the service center.

Problems	Causes and remedies	
	Camera	Receiver
No power (no picture/sound)	-AC adaptor not plugged in -Power switch not turned on	-AC adaptor not plugged in -Power switch not turned on -TV or Monitor not turned on -Improper A/V cable connection
Poor reception	-Adjust antenna direction -Turn on the Power switch -Improper channel 1-4 selection	-Adjust antenna direction -Turn on the Power switch -Improper channel 1-4 selection
Picture flickering Picture too bright, or too dark	-Strong spot light in the field of view -Lighting source in the field of view	-Adjust brightness control on TV/Monitor
Picture rolls and jumps or scrambled picture	-Adjust antenna direction	-Adjust antenna direction

2.4 GHz WIRELESS CAMERA

Image sensor	1/4" B/W or 1/3" color CMOS imager		
Lens	F1.8/f6.0mm 64° wide - angle lens		
Picture element	B/W	352(H) × 288(V)	CCIR or
		320(H) × 240(V)	EIA
	Color	628(H) × 582(V)	PAL or
		510(H) × 492(V)	NTSC
Scanning system	2:1 interlace		
Scanning frequency	15.625KHz(H) 50Hz(V)		CCIR or
	15.734KHz(H) 59.94Hz(V)		EIA
Sync. system	Internal Synchronization		
Resolution	260 TV lines (B/W) 380 TV lines (Color)		
Min. illuminations	0.5 Lux (B/W) 3 Lux (Color)		
Video output	1.0Vp-p / 75 Ohm		
Gamma characteristics	$\gamma = 0.45$		
Auto Iris	Electrical Auto Iris		
	Shutter sensitivity: 1/60-1/6000sec		(B/W)
	1/60-1/15000sec		(Color)
Microphone	Electrets Condenser		
Transmitting frequency	2.4GHz ~ 2.4835GHz (4Ch)		
Modulation	FM		
RF out level	90dB μ V/m, at 3meters		
Video input level	1.0Vp-p / 75 Ohm		
Audio input level	20mVp-p / 600 Ohm		
Antenna	Directional high gain antenna		
Operating temperature	0°C ~ 50°C		
Power source	DC12V 500mA AC Adaptor		
Dimensions	10(W) × 4.8(H) × 14cm(D)		
Weight	Approx 250g		

SERIES 2.4GHz WIRELESS CAMERA SYSTEM

Function \ Model	2071T/R	2072T/R	2073T/R	2074T/R
Camera	B/W	B/W	Color	Color
With IR Remote Controller	yes	no	yes	no

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